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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,940

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Tetsuo Fujii

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EXAMINER

JACKSON JR, JEROME

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

07/07/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,940	Applicant(s) FUJII ET AL.	
	Examiner Jerome Jackson Jr.	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/3/09 has been entered.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-16, 25 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no original support for the new language "each of the cones is at least the size of the wavelength of the light extracted through the surface".

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is no antecedent for “the nitrogen face (N-face) of the LED”. There is no antecedent for “the wavelength of light”. There is no exact diode structure claimed. The structure of the “diode” is vague and indefinite. The language “based” is vague and indefinite. The language “an emitting layer” is indefinite as there is no structural relationship of such layer (with any other layer?) in the indefinite “diode” structure. “Size” is indefinite. Other claims are rejected for dependence on claim 1.

Claim 2 contradicts claim 1 as “one” cone is not a plurality of cones.

Claim 16 is indefinite as “epoxy on the structured surface” has no antecedent and is indefinite.

Claim 17 is vague and indefinite as no diode structure is defined, similar to claim 1. The language “based” is indefinite. The language “an emitting layer” is indefinite. The language “structuring” is indefinite. The language “to enhance” is indefinite. Enhanced from what to what?

Claim 18 is indefinite as “structured” and “enhance” are indefinite.

Claim 20 is indefinite as “n-type layer” does not have antecedent.

Other claims are rejected for dependence on a rejected claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-26, as best understood, are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Palacios et al, (P), of record.

Palacios discloses an N-face of a GaN layer etched with KOH to form pyramids (cones) enhancing extraction of photoluminescent light. Claim 1 does not define any “diode” structure distinguishing over Palacios. The label “diode” in claim 1 does not inherently define a p-n junction in claim 1 and there is no p-layer claimed. There is no specific “diode” structure claimed and no distinction over Palacios. The very purpose of Palacios is to enhance extraction of light out of the structure, therefore the pyramids are designed to be of a “size” to enhance light extraction. Claim 1 reciting cone sizes for enhancing light extraction is prima facie obvious or anticipated over Palacios. Figure 1 of Palacios discloses etching depths up to 9000 angstroms. The photoluminescent light extracted out of the Palacios device peaks at 3.485 eV (approx. 3200 angstroms). Therefore Palacios discloses pyramids (cones) at least the size (height or depth) of the wavelength of emitted light. Claim 1 is rejected.

Claim 2 is rejected as there are multiple pyramids.

Claim 3 is rejected as P functions in the same manner.

Claims 4-6 and 8 are rejected as the final product does not distinguish over P regardless of the method used to make it. See the previously recited caselaw on product by process claims.

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Claim 7 is rejected as it would have been prima facie obvious to fabricate p-n junctions in the Palacios material to form diodes, lasers, detectors, etc. See the Introduction on the first page of P.

Claims 15 and 16 are rejected as the pyramids of Palacios are likewise structured.

Claims 17 and 19 are rejected as P fabricates a structured N-face GaN light emitting "diode", diode here being merely a label for an emission structure as no particular "diode" structure is claimed.

Claim 20 is rejected as above.

Claim 22 is rejected as P practices a wet etch.

Claim 23 is rejected as there is no particular photo method claimed to distinguish over the etching of P, where photons inherently are present during the etching and effect the etching.

Claim 24 is rejected as the N-face of P is structured by roughening to form pyramids.

Claims 25 and 26 are likewise rejected.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palacios in view of Motoki 6,468,882 and Nishida et al APL Vol. 79 No.6, August 6, 2001 "Efficient ...GaN and Wong et al October 30, 2000 "InGaN...laser lift off".

P discloses cones for enhanced GaN light emission. Motoki discloses c-plane GaN substrates for GaN based emitters as P as GaN substrates are better lattice matched to GaN emitters and enable contacts to GaN material. It would have been obvious to practice a GaN based substrate with cones from P. From Nishida p-n junction light emitting diode structure is obvious for GaN based devices. From Wong dry

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etching is obvious alternative etching for forming a grooves and p-n junction diode structure. all claims, as best understood, are obvious.

Applicant's arguments filed 4/3/09 have been fully considered but they are not persuasive. Applicant argues P does not disclose cones the size of the wavelength of emitted light. First the wavelength is not definite, secondly, the recitation is new matter, and thirdly, P discloses emission of light wavelengths of the order of the cone size.

Regarding the fabrication claims, the language "based" is indefinite, and contrary to the arguments, P discloses cone formation on the N-face by etching. The arguments are unpersuasive.

Regarding n-type layers, LED diodes in the applied art teach n-type and p-type layers for LED emission structures, And P clearly discloses "cones" or pyramids on an N-face to enhance extraction of photons. The arguments are unconvincing of patentability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerome Jackson Jr. whose telephone number is 571-272-1730. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerome Jackson Jr./
Primary Examiner, Art Unit 2815